

IN THE CLAIMS:

Claims 1, 7, 15, 16, and 22 have been amended herein. All of the pending claims are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

Listing of the Claims:

1. (Currently amended) A method of inducing or enhancing production of at least one secondary metabolite by plant cells, said method comprising:

transforming plant cells with an expression vector comprising an expression cassette comprising a gene encoding an ABC-transporter;

wherein said ABC-transporter comprises a Walker A box, a Walker B box, and a Nucleotide Binding Fold;

wherein said ABC-transporter functions to transport at least one secondary metabolite in plant cells; and

selecting transformed plant cells having an induced or enhanced production of at least one secondary metabolite; and

propagating such selected transformed plant cells.

2. (Original) The method according to claim 1 wherein the secondary metabolites are alkaloids.

3. (Original) The method according to claim 1 wherein the ABC-transporters are of plant, fungal, or mammalian origin.

4. (Original) The method according to claim 1 wherein the induction or enhancement of the production of at least one secondary metabolite by plant cells results from enhancing the transport of said secondary metabolite into a vacuole.

5. (Original) The method according to claim 4 wherein the secondary metabolites are alkaloids.

6. (Original) The method according to claim 4 wherein the ABC-transporters are of plant, fungal, or mammalian origin.

7. (Currently amended) A method of stimulating the production of secondary metabolites by plants, the method comprising:

transforming said plants with an expression vector comprising an expression cassette comprising a gene encoding an ABC-transporter;

wherein said ABC-transporter comprises a Walker A box, a Walker B box, and a Nucleotide Binding Fold; and

wherein said ABC-transporter functions to transport at least one secondary metabolite in plant cells; and

selecting transformed plants based upon enhanced production of secondary metabolites[[,]]; and

propagating such selected transformed plants.

8. (Original) The method according to claim 7 wherein the secondary metabolites are alkaloids.

9. (Original) The method according to claim 7 wherein the ABC-transporters are of plant, fungal, or mammalian origin.

10. (Previously presented) A transgenic plant cell culture displaying an enhanced production of at least one secondary metabolite, wherein said transgenic plant cell is transformed with an expression vector comprising an expression cassette comprising a gene encoding an ABC-transporter;

wherein said ABC-transporter comprises a Walker A box, a Walker B box, and a Nucleotide Binding Fold; and

wherein said ABC-transporter functions to transport at least one secondary metabolite in plant cells.

11. (Original) The transgenic plant cell culture of claim 10 further characterized in having

- (1) an increased vacuolar localization of said at least one secondary metabolite, or
- (2) a secretion or an increased secretion of said at least one secondary metabolite.

12. (Previously presented) A transgenic plant material selected from the group consisting of a plant, plant cells, plant seeds and plant progeny, said transgenic plant material capable of an enhanced production of at least one secondary metabolite, said transgenic plant material transformed with an expression vector comprising an expression cassette comprising a gene encoding an ABC-transporter;

wherein said ABC-transporter comprises a Walker A box, a Walker B box, and a Nucleotide Binding Fold; and

wherein said ABC-transporter functions to transport at least one secondary metabolite in plant cells.

13. (Original) The transgenic plant material of claim 12 further characterized in having an increased vacuolar localization of said at least one secondary metabolite.

14. (Cancelled).

15. (Currently amended) An isolated polynucleotide sequence comprising a sequence having at least 91% identity to ~~a sequence selected from the group consisting of the~~ polynucleotide sequence of SEQ ID NO:1 ~~and the polypeptide sequence of SEQ ID NO:2;~~

wherein the isolated polynucleotide sequence induces or enhances production ~~or secretion~~ of at least one secondary metabolite in plants.

16. (Currently amended) A process for producing a plant cell exhibiting an enhanced production of at least one secondary metabolite, said process comprising:

transforming a plant cell with an expression cassette comprising a gene encoding an ABC-transporter;

wherein said ABC-transporter comprises a Walker A box, a Walker B box, and a Nucleotide Binding Fold; ~~and~~

wherein said ABC-transporter functions to transport at least one secondary metabolite in plant cells; ~~and~~

selecting transformed plant cells exhibiting enhanced ~~transport~~ production; ~~and~~

selecting, from among the transformed plant cells, plant cells exhibiting enhanced production of said at least one secondary metabolite into a vacuole.

17. (Original) A plant cell produced by the process of claim 16.

18. (Original) A transgenic plant including the plant cell of claim 17.

19. (Previously presented) An isolated polynucleotide useful for producing a plant cell exhibiting an enhanced production of at least one secondary metabolite, said isolated polynucleotide comprising:

a first sequence of nucleotide bases constituting a means for inducing or enhancing production of at least one secondary metabolite in plants or plant cells, and

a second sequence of nucleotides bases, operatively positioned with respect to said first sequence, constituting a means for promoting expression of said first sequence.

20. (Previously Presented) The isolated polynucleotide sequence of claim 15, wherein the isolated polynucleotide sequence comprises the polynucleotide sequence of SEQ ID NO:1.

21. (Previously Presented) The isolated polynucleotide sequence of claim 15, wherein the isolated polynucleotide sequence comprises the polypeptide sequence of SEQ ID NO:2.

22. (Currently amended) A method of inducing or enhancing production or cellular secretion of at least one endogenous secondary metabolite by a plant cell, the method comprising:

transforming the plant cell with an expression vector comprising an expression cassette comprising a gene encoding an ABC-transporter, wherein said ABC-transporter comprises a Walker A box, a Walker B box, and a Nucleotide Binding Fold, and functions to transport at least one secondary metabolite in plant cells;

wherein the secondary metabolite is an endogenous metabolic product of the plant cell, and is transported from the cell to the extracellular space; and

wherein the amount of secondary metabolite recoverable from the cell is increased; and
selecting a transformed plant cell having an induced or enhanced production of at least one secondary metabolite; and

propagating such selected transformed plant cell.

23. (Previously Presented) The method according to claim 22 wherein the secondary metabolite is an alkaloid.

24. (Previously Presented) The method according to claim 22 wherein the ABC-transporter is of plant, fungal, or mammalian origin.